

# Giant Cell Tumor of the Tendon Sheath in the Posterior Intercondylar Region of the Knee: Case Report

Tumor de células gigantes de la vaina sinovial en la región intercondilar posterior de la rodilla: Presentación de caso



## Key words (MeSH)

Giant cell tumor  
Knee  
Magnetic resonance imaging

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## Palabras clave (DeCS)

Tumor de células gigantes  
Rodilla  
Imagen por resonancia magnética

## Summary

The giant cell tumor of the tendon sheath, after the ganglion cyst, is the most common mass in the hand; followed by the ankle and the foot. The knee represents a less common location and it usually occurs in children. In the knee, the usual presentation is intrarticular, and the most frequent location is in the infrapatellar region, followed by the suprapatellar region, and less frequently the posterior intercondylar region. A case of a healthy 26-year-old woman with pain in the right popliteal fossa associated with increased volume is presented. The MRI showed an intra articular heterogeneous solid mass, centrally located in the posterior intercondylar region, with heterogeneous enhancement. Pigmented villonodular synovitis was considered as the first possible differential diagnoses. Histopathological analysis demonstrated a giant cell tumor of the tendon sheath of the joint capsule. The objective of this case report is to show the magnetic resonance (MR) characteristics of a giant cell tumor of the tendon sheath arising from the joint capsule, an uncommon location of this type of lesion.

## Resumen

El tumor de células gigantes de la vaina tendinosa es, después del ganglión, la masa más común en la mano; se ha descrito su localización en articulaciones de mayor tamaño como el tobillo y el pie. La rodilla es la localización menos frecuente y suele presentarse en niños. En la rodilla la forma de presentación usual es intraarticular y la localización más frecuente es infrapatelar, seguido de la suprapatelar y en menor frecuencia la región posterior intercondilar. Se expone el caso de una mujer sana de 26 años de edad con dolor en la fosa poplíteica izquierda asociado a aumento de volumen. La resonancia magnética (RM) mostró una masa sólida, heterogénea, intraarticular, localizada en la región posteromedial de la rodilla, con realce difuso con el medio de contraste. Se consideró como primera posibilidad diagnóstica una sinovitis villonodular pigmentada. El estudio histopatológico mostró un tumor de células gigantes de la vaina tendinosa de la cápsula articular. El objetivo de esta presentación de caso es demostrar las características en RM de un tumor de células gigantes de la vaina tendinosa de la cápsula de la rodilla, una de las localizaciones menos frecuentes de esta lesión.



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## Introduction

The giant cell tumor of the tendon sheath is common in the hand and wrist, followed by the ankle and foot. The knee is an infrequent location

that appears primarily in children. In adults, an approximate incidence of 1.8 per 1 million has been reported (1). It usually occurs in women between the third and fifth decades of life (2) and is characterized

by symptoms of insidious onset with edema and long-term local pain, in some cases mechanical symptoms such as blockage and instability may appear (1).

We describe the case of a giant cell tumor of the intraarticular tendon sheath in the posterior intercondylar aspect of the knee in a 26 year old woman. It is important, in images, to identify the characteristics of this tumor, in an unusual location with nonspecific symptoms, in order to take into account this pathology within the differential diagnoses and provide the proper treatment.

## Case presentation

It is a 26-year-old woman with a one-month pain, spontaneous onset, on the posterior aspect of the right knee, associated with increased volume. Physical examination identifies articular effusion and pain at hyperflexion; no signs of instability were observed.

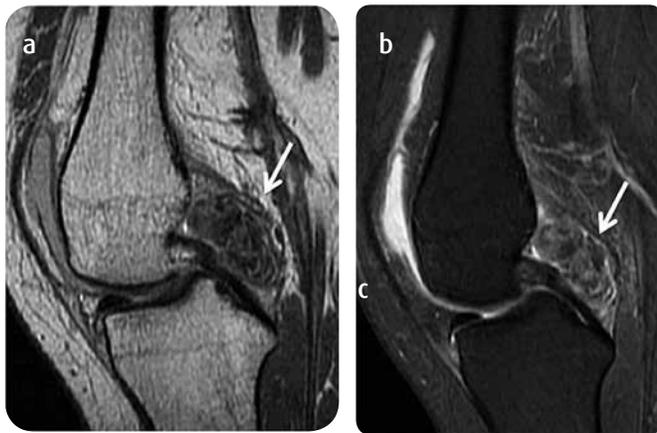


Figure 1. MRI of the right knee. Sagittal images. (a) FSE SD (TR: 1067, TE: 20). (b) FSE DP with fat saturation (TR: 3500 TE: 36). A solid, heterogeneous, intraarticular mass is well defined in the posterior aspect of the intercondylar region, posterior to the posterior cruciate ligament (arrows).

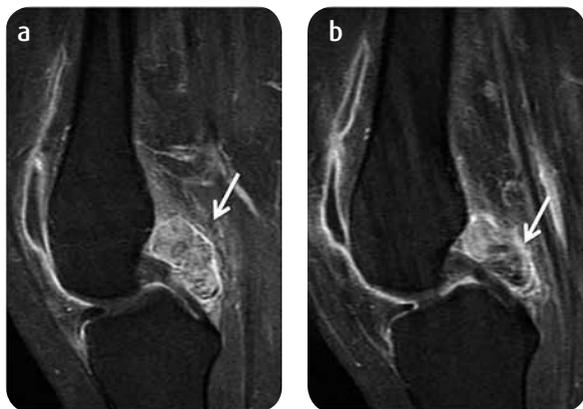


Figure 2. MRI of the right knee. (a) and (b) Sagittal images with FSE T1 information with post-contrast fat saturation (TR: 600 TE: 9.9). An intense heterogeneous enhancement of the lesion (arrows) is observed.

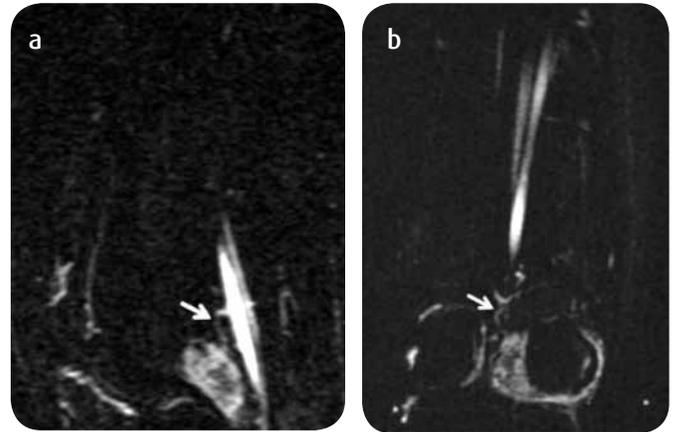


Figure 3. Right knee angioresonance. Reconstructions (a) sagittal and (b) coronal: The vascularization of the lesion comes from the genicular branches of the popliteal artery (arrows).

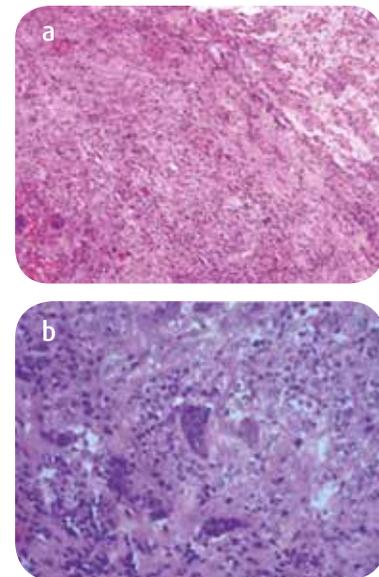


Figure 4. (a) H & E, magnification 20X. (b) H & E, magnification 40X. Giant cell tumor of the tendinous sheath with the characteristic histological picture constituted by small histiocytoid cells, intermixed with large epithelioid cells and multinucleated giant cells. In addition, in the upper right half (a) the presence of foamy histiocytes and foci with hemosiderin deposits are observed.

In magnetic resonance imaging (MRI), an intraarticular solid mass was found in the posterior aspect of the intercondylar region, behind the posterior cruciate ligament, with heterogeneous signal in the mixed information (proton density) and fat saturation T2 sequences, with low signal foci representing hemosiderin deposits and dimensions of 28 mm x 15 mm x 8.5 mm (Figure 1). In the dynamic sequences after the contrast medium, the lesion shows an intense heterogeneous enhancement (Figure 2). In the angiographic sequences the vascularization of the lesion comes from the genicular arteries, branches of the popliteal artery (Figure 3). A pigmentary villonodular synovitis was considered as the first diagnostic possibility.

Surgery was performed; histopathological analysis of the mass showed a nodular lesion formed by mononuclear polygonal cells without atypia, mixed with multinucleated osteoclast giant cells, foci of haemorrhage with haemosiderophages, foci of histiocyte accumulations and areas of sclerosis (Figure 4). The findings were compatible with a giant cell tumor of the synovial sheath. No residual mass was observed in the control study.

## Discussion

The giant cell tumor has an isolated localized form that compromises the tendon sheath of a tendon, also called nodular tenosynovitis; an intraarticular form (nodular synovitis) and a diffuse form (known as proliferative synovitis or extraarticular pigmented villonodular synovitis) (3). The localized form is the most frequent and usually appears in 80% of cases in the flying aspect of the hand (4) and in 85% in the fingers. An approximate knee incidence of 12% has been reported (5). In the knee, the most common presentation is intraarticular, with an infrapatellar incidence of approximately 67%; suprapatellar, 24%; posterior intercondylar, 10% (6).

Patients are usually asymptomatic or show a painful mass in the soft tissues. Microscopically, the giant cell tumor consists of three types of cells: osteoclastic multinucleated giant cells, round or polygonal mononuclear cells, and foam cells or histiocytes (4). X-rays are usually normal, although they may show bone erosion or soft tissue edema. In MR, in the localized form, the lesions are usually small with a diameter of approximately 1.1 cm; a well-defined, eccentric mass, which partially or completely surrounds a tendon, is observed with low or intermediate signal in spin echo sequences T1 and T2. In the intraarticular form they often present as single, well-defined lesions. In MRI they are observed as an intermediate signal mass to the muscle in sequences with T1 information and low signal in sequences with T2 information. The diffuse form is characterized by being large lesions, irregular, located around a large joint. In MRI they are manifested as a homogeneous soft tissue mass in the T1 and T2 information sequences; this effect increases in the gradient echo sequences due to the artifact of magnetic susceptibility by the hemosiderin content. With contrast medium administration, moderate enhancement is observed because of the numerous capillaries in the stroma (4). The treatment is surgical, with a recurrence in approximately 44 to 50% of the cases (3, 7).

Differential diagnoses should include ganglion, hemangioma, synovial sarcoma and granulomas, which show high signal in T2-weighted MR sequences, which differentiate them from a giant cell tumor of the tendon sheath. Sarcomas and desmoid tumors may show low signal intensity in T2-weighted images due to collagen content (4, 8); in these cases, a mass of low signal intensity in the T1 and T2 enhanced sequences favors the diagnosis of a giant cell tumor of the tendon sheath.

In conclusion, the giant cell tumor of the tendinous sheath is a rare entity in the knee; MRI is the modality of choice in diagnosis, surgical planning and follow-up.

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